Remarks

Claims 1-31 were pending prior to this Response. By the present communication, no new claims have been added, claims 2 and 16 have been canceled, and claims 1, 15, and 17 have been amended to define Applicants' invention with greater particularity. Support for the amendments may be found at e.g., page 8, paragraphs [0035] through [0037]; page 9, paragraph [0042]; page 10, paragraph [0046]; page 11, paragraph [0050]; Figure 1 and throughout the specification and claims as originally filed. No new matter has been added. Accordingly, upon entry of the present amendment, claims 1, 3-15, and 17-31 will be pending and under consideration in this application.

Rejections under 35 U.S.C. § 103(a)

Applicants respectfully traverse the rejection of claims 1-2, 4-11, 13-16, 18-20, and 27-31 under 35 U.S.C. §103(a) as allegedly obvious over Bryner et al. (U.S. Patent No. 7,585,451 B2; hereinafter "Bryner").

The U.S. Supreme Court decision in *KSR International v. Teleflex Inc.* (82 USPQ 2d 1385), modified the standard for establishing a *prima facie* case of obviousness. Under the *KSR* rule, three basic criteria are considered. First, some suggestion or motivation to modify a reference or to combine the teachings of multiple references still has to be shown. Second, the combination has to suggest a reasonable expectation of success. Third, the prior art reference or combination has to teach or suggest all of the recited claim limitations. Factors such as the general state of the art and common sense may be considered when determining the feasibility of modifying and/or combining references.

The new Guidelines establishing standards for obviousness emphasize that Examiners "must provide a reasoned explanation as to why the invention as claimed would have been obvious," and are equally clear that "familiar lines of argument," *e.g.*, a showing of unexpected results, a lack of reasonable expectation of success, and a teaching away from the claimed invention by the prior art, can still demonstrate the non-obviousness of a claimed invention. Applicants submit that the Examiner has not met this burden for the reasons discussed below.

In particular, the Office Action asserts (page 4) that the Bryner discloses, in Figure 2 of the document, an apparatus for fabricating oriented polymers comprising. In support of its position, the Action states "(a) positioning an electrode (**Items 140 and/or 142**) near an orifice (**Item 104**) of a dispenser (**Item 102**) containing a metastable electrically charged polymer dispersion."

While not acquiescing to the rationale provided by the Office Action and in order to advance prosecution, Applicants have amended independent claim 1, drawn to an apparatus for fabricating oriented polymer fibers. Claim 1, as amended, recites, in pertinent part, an apparatus comprised of a dispenser with a source of electric potential directly connected to the dispenser at the proximal end of the dispenser near the orifice.

Applicants point to Bryner at Figure 2 and column 2, lines 25-30, which states "...a polymer stream comprising a polymer and a solvent, or a polymer melt, is fed from a storage tank, or in the case of a polymer melt from an extruder 100 to a spinning nozzle 104, (also referred to as a "die") located in the spinneret 102 through which the polymer stream is discharged." Bryner further discloses at column 3, lines 3-6 "[t]he angular die tip [orifice], and therefore the spinning nozzle(s), is positioned such that it extends beyond the end of the spinneret [dispenser] and gas nozzles a distance 'e'." The document also describes that voltage is applied to the spinneret at column 3, line 65 bridging to column 4, line 17, column 5, lines 41-42 and specifically states at column 4, lines 61-62 that the "needle tip [spinning nozzle; 104] protrudes 2.5 mm below the conductive face of the spin pack [dispenser; 102] body. A high voltage is applied to the spin pack body." Figure 2 of Bryner clearly shows that the voltage is not applied to the die tip (104), which extends past the body of the spinneret (102).

Thus, Bryner describes application of an electrical potential away from the spinning nozzle (104), from which the polymer stream exits. In contrast, the present claims recite and apparatus that requires a source of electric potential connected to the area of the dispenser near the orifice. Applicants submit that Bryner fails to teach or suggest each and every limitation of the present claims. Bryner does not provide the skilled artisan with motivation to modify the apparatus disclosed therein in such a way as to arrive at the apparatus of the present claims,

wherein voltage is applied to the dispenser in close proximity to the orifice. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection as it applies to independent claim 1 and all claims dependent therefrom.

With regard to claim 15, the Office Action further asserts (page 4) that Bryner discloses "a method and apparatus capable of containing the materials recited...for fabricating oriented polymer fibers." Applicants respectfully disagree.

Without acquiescing to the reasoning provided by the Office Action, and in order to expedite prosecution, Applicants have amended independent claim 15, which is drawn to a method of fabricating oriented polymer fibers. Claim 15, as amended, recites "...electrically charging the metastable polymer dispersion with a source of electric potential, wherein the polymer dispersion is charged inside the dispenser; (c) applying electric potential with a voltage of between about 20 kV and 40 kV to the electrode, thereby charging the electrode, wherein the charge applied to the electrode is opposite to the charge of the polymer dispersion; (d) electrically pulling (electropulling) the charged polymer dispersion from the dispenser through the orifice-with the oppositely charged electrode."

Nowhere does Bryner describe or suggest charging the polymer in the dispenser much less charging the *polymer* with a charge opposite that to of the electrodes. In fact, Bryner states (Abstract) "[t]he process includes applying a high voltage to the spinneret and grounding the electrode such that an electric field is generated between the spinneret and the electrode of sufficient strength to impart an electrical charge on the polymer *as it issues from the spinning nozzle* [emphasis added]." The method of Bryner does not include prior and direct charging of the polymer solution with an electrical potential, but relies on the electric field to impart a charge to the free surface of the fluid. Accordingly, Bryner fails to teach each and every limitation of the presently claimed method.

Furthermore, Bryner does not suggest modifying the method disclosed therein in such a way as to arrive at the method of the present claims. The method of Bryner for fabricating polymers relies, in large part, on a gas stream and Bryner states at column 2, lines 40-47 "the forwarding gas stream provides the majority of the forwarding forces in the initial stages of

drawing of the fibers from the issued polymer stream." Thus, the skilled artisan would not be motivated to modify the method of Bryner in order to arrive at the presently claimed method of electropulling fibers comprised of an electrostatic attraction between an electrically charged polymer dispersion and oppositely charged electrodes. In view of the foregoing discussion, Applicants respectfully submit the rejection as it applies to independent claim 15, and all claims dependent therefrom, is improper and request it be withdrawn.

Applicants respectfully traverse the rejection of claims 3 and 17 under 35 U.S.C. §103(a) as allegedly obvious over Bryner et al. (U.S. Patent No. 7,585,451 B2; hereinafter "Bryner") in view of Lee et al (U.S. Patent Application No. 2002/0122840 A1; hereinafter "Lee").

In particular, the Office Action acknowledges (page 8) that Bryner is silent with regard to the source of electrostatic potential and supplies Lee alleging that "it would have been obvious to a person having ordinary skill in the art at the time of the invention to use a direct current battery as per Lee as the source of the electric potential in Bryner's process."

For the reasons discussed above, Applicants submit that Bryner fails to teach each and every limitation of the apparatus recited in independent claim 1 and the method recited in independent claim 15.

Lee does not cure the defects of Bryner because this publication does not disclose or suggest the apparatus and method of the present claims. Instead, this document discloses an apparatus comprising a barrel to contain polymer materials in the liquid state, a pump for pressurizing and supplying the polymer materials to a spinning part, which injects the polymer materials in the liquid state through charged nozzles onto a collector. The method of Lee for fabricating polymer webs entails charging the polymer materials after they have been discharged through the nozzles (see Lee, page 1, paragraph [0016] and Figure 1a). Thus Lee does not provide motivation to the skilled artisan for modifying the apparatus of Bryner in such a way as to arrive at the method or the apparatus of the instant claims. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection.

Applicants respectfully traverse the rejection of claim 12 under 35 U.S.C. §103(a) as allegedly obvious over Bryner et al. (U.S. Patent No. 7,585,451 B2; hereinafter "Bryner")as applied to claim 1, and in view of Childs et al. (U.S. Patent No. 2,338,570; hereinafter "Childs").

The Office Action acknowledges that Bryner is silent with regard to appropriate materials for construction of spinnerets and turns to Childs to cure the deficiency.

As discussed above, Bryner fails to disclose each and every limitation of the claimed invention. In particular, Bryner does not describe a source of an electric potential placed in close proximity to an orifice of a dispenser, as required by claim 1. Applicants have shown above that Bryner advocates placement of a voltage source on the face of the spinneret from which a nozzle extends a considerable distance.

Childs discloses an electrospinning apparatus comprising a tank from which spinning solution is conducted via a conduit, valve, and meter pump to a candle filter and finally to a spinneret (see Figure 1 and page 2, lines 64-69). Applicants submit that Childs is silent with regard to the placement of an electric potential near an orifice of a dispenser including a proximal end and a distal end, wherein the proximal end defines an orifice. Childs discloses on page 2, lines 35-49 that the source of potential is connected to a metallic pipe (15, in Figure 1) and to an electrode (16, in Figure 1) "in a side wall of the cabinet below and on the opposite side from the spinneret." The combination of Bryner and Childs fails to teach or suggest all of the recited claim limitations of the instant application. Nor would a skilled artisan be motivated by the disclosure of Childs, or based on their own knowledge, to modify the apparatus of Bryner in order to arrive at the apparatus of the present claims. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection.

Applicants respectfully traverse the rejection of claims 21-26 under 35 U.S.C. §103(a) as allegedly obvious over Bryner et al. (U.S. Patent No. 7,585,451 B2; hereinafter "Bryner") as applied to claim 18 in view of Chu et al (U.S. Patent Application No. 2003/0054035).

In particular, the Office Action alleges that Bryner "teaches the general method as applied above but is silent regarding pre-dissolution of the polymer; the identity of the polymer;

and whether the metastable dispersion further comprises a compound to decrease its stability (pages 10-11). The Office Action asserts, with regard to claims 21-26, that Chu discloses pre-dissolving material prior to adding to a larger liquid phase; poly(lactic acid-co-glyocolic acid) as the polymeric material; and an additive for the metastable dispersion, wherein the additive is sodium chloride. The Action concludes that it would have been obvious to the skilled artisan to modify the disclosure of Bryner in view of Chu to arrive at the method of the present claims. Applicants respectfully disagree.

Applicants have shown above that Bryner does not teach each and every limitation of the method recited in independent claim 15 for the preparation of oriented polymer fibers. The method of the instant claims, as amended, requires that a metastable polymer dispersion is subject to an electric charge while it is contained within a dispenser, wherein the charge is the opposite of a charged electrode placed in proximity to the orifice of the dispenser. In this manner, the charged polymer dispersion is drawn by electrostatic forces to the electrode.

Chu does not cure the deficiency of Bryner, rather this document describes the process of electrospinning (at page 2, paragraph [0012]), which in principle entails imparting an electrical charge on the free surface of a droplet containing polymeric material *after* it is discharged from a nozzle. In contrast, the presently claimed method for fabricating oriented polymers requires that that the polymeric material is charged *prior* to leaving a dispenser. Charging the dispersion while it is contained in the dispenser is critical to the method as claimed, given that the electrode placed in proximity to the orifice of the apparatus is oppositely charged, thereby resulting in an electrostatic attraction between the electrode and the dispersion. Chu, like Bryner, relies on the process of electrospinning for fabrication of a fibrous matrix (see page 2, paragraph [0027] of Chu). Chu does not disclose first charging a dispersion of polymeric material and charging an electrode with an opposite charge to that of the dispersion thus, Chu does not cure the deficiency of Bryner. As such, the combination of Bryner and Chu fails to teach each and every limitation of the instant claims. The skilled artisan would not be motivated by the disclosure of Chu, or in view of their own general knowledge, to modify Bryner and arrive at the method recited in claim 18. Accordingly, Applicants respectfully request withdrawal of the rejection as it applies to

claim 18 and claims dependent therefrom.

CONCLUSION

Applicants believe that the present application is now in condition for allowance. Favorable consideration of the application as amended is respectfully requested. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge $810.00 to cover the payment of a Request for Continued Examination fee, large entity to Deposit Account 07-1896. Additionally, the Commissioner is authorized to charge any other fees associated with the filing submitted herewith, or credit any overpayments to Deposit Account No. 07-1896 referencing the above-identified attorney docket number.

Respectfully submitted,

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